

A Modern Approach Development for Boarding House Management Application

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Abstract

BunkHouse is hostel management application designed to interconnect and bridge the gap between students residing in hostel, the authorities and the hostel management. Its aim is to build a latest generation Android based application for managing and tracking all the issues in a Hostel. It has a very friendly user interface designed to provide the best user experience. Nowadays students in hostel find it very difficult to approach authority for any minor or major issues they face, they have to visit their cabin for every little problem they have. Same situation is being faced by the hostel authorities in maintaining large volumes of data physically, in providing notices to students, maintaining student records and many other affairs. Keeping these situations in mind we have designed this application which is a two way communication and maintenance portal where all the activities that students and admins need to perform has been taken care of and automated. There are two key features in PL, User Interaction and Hostel Management.

Keywords: Android; Java; Tracking; User Interaction

Introduction

Over the most recent four decades there has been an exponential increment in the quantity of educational sectors all around the world. This impeccable improvement has brought education to the doorstep of individuals but a major portion of the educational institutions are still using the old and tedious procedure and protocols for maintaining all the record keeping and more particularly for managing the hostel facilities. These kinds of old methods of managing records and documents and other facilities manually with human labour have a bad outcome on the institute's efficiency.

The proposed scheme for hostel management has a goal. It is to provide a dedicated online platform to the hostellers and people in admin panel so that the manual work tension of hostel management could be reduced and make them experience much easier ways of

management both for the students and the college organization. In the online platform, students will be able to interact with the other admin easily, track their fee payment status, update their details, easily reach the management regarding any issue or problem [1].

For the admin, it will be much easier to promote a notice among all students or even send a notice or reminder to particular student personally, read and update student details, manage student's room's stuffs allowances, manage hostel records, review or reject student's application or complaints etc. Our main objective is to provide a platform and convert the mundane process of hostel management into a simple easy task by keeping data integrity a major concern and a clean architecture along with data security the second major concern. Identification of the loopholes of the current hostel management systems resulted in the event of developing a solutions which results in more user friendly and provides smooth

operating GUI compared to the existing hostel management framework. Through this we can substantially increase the outcome and also conquer the loopholes of the system that is live and existing.

Literature Review

While searching for the existing literature on this innovation – Hostel Management System by an Automated Hostel Management product or application, we concluded that numerous amount of similar products are already being used by many colleges and universities all around the world. Description of some of these is given below.

Initio developed the “College Hostel Management software” application that consists of around six modules. The transport module, the inventory module, the hostel module, the enquiry module, the library module and the visitors tracking module offering various information on the hostel building, rooms inside them and students accommodating these rooms. Searching further we found another software application product that totally automates the hostel management services - Microbes Hostel system. They have several powerful features consisting of reservation management, cash box synchronization, managing accounts and statistics online and generating online statements.

“Loventis booking system” is a development of from Loventis systems which has some of the best features like channel manager and PMS.

A substantial numbers of hostel management system repositories were carefully scanned and many comparisons were made in order to get the proposed or desired product for this project. For example, a lot of projects from Github about Hostel management system were downloaded and examined which helped us in our initial research for hostel management. Among other web site that was used in our research is geeksforgeeks.com. It provided me with different codes which I will use in the development of this program. Using of textbooks and journal on internet was also an excellent source of data and assistance in realizing the goal of this project. For instance, some ebooks on java backend development and java programming gave a good layout of product design [1,2].

Tools used

Front-End (Xml)

XML have been used to give the basic layout of our android-app. BunkHouse has many layout pages the frontend of which is entirely build using Xml Language. It is generally used for storing and transporting data but with Android Studio we can totally design the layout of an activity with Xml.

Back-end (Java)

JavaEE is an acronym for Java Enterprise Edition. Our server-side development is totally done using JavaEE. It is used to communicate with a real-time database via APIs and perform all the operations appropriately.

Database (FireBase)

FireBase as database for data management purposes have been used in our project. Tables have been created using FireBase tools provided in individual’s account. It has also been used for authentication purposes during sign-in of a user as admin or student. We have implemented OTP based phone authentications keeping data integrity a major concern [3].

Problem statement

Management decreased student’s motivation. Students were not able to fully interact with the hostel admins and even the admins could not track the complaints of the student’s most of the time. This leads to delay in resolving student’s problem like electrical issues, space issues, mess issues and fee related issues. But through an application like this hostellers could easily get everything simplified and done without any physical or manual work done like visiting the admin every time for small doubts. The students have to ping the admin which in their case will be the warden for every little thing that otherwise could be done in hostel offline by simply going to their cabin. There is very less co-ordination between the warden and the hostellers due to difference in their schedules and exams etc. But even before, the whole system was due a change as there were lot of areas which required improvement. We have developed this framework to favour the hostel management team which will be helpful for them a lot in providing and managing the records of the hostellers [4].

In these times of Covid, it could help reduce manual tension as nowadays it gets very difficult and tedious task to search for the records and information of hostellers who are currently residing in the hostel and also who have left the hostel.

Scope and limitations

The above research could be combined with multiple other features which in turn could be used to develop a hostel management system. The proposed system idea will help in the following areas: New Hostellers will no longer have to apply for the college hostel manually. The admin panel can read and access student data anytime.

Hostellers already residing in the university hostel no longer have to visit manually to the admin for any query or problem. Hostellers can communicate among themselves. Users can send or receive attachments. Any new notice from the admin panel can be directly forwarded to the hostellers anytime. The Admin Panel can track the status of a particular hosteller's Fee payment.

Existing system

Current situation of hostel management is a framework that is offline and required manual work done. Limitations of Existing system: Information retrieval is very tedious due to huge volume of documents stored in different sections or rooms. Little to no interaction among the hostellers and admin. No Data Security and Data Integrity concerns in the current framework [5]. No dedicated database to store all the records of the students as well as hostel records. The entire process in the current framework is tedious and a waste of human potential and material assets. Record management and searching is a very difficult job. Current framework has no alternatives or options in cases of natural phenomenon which can lead to Data Loss [6,7].

Implementation

We have proposed a new system called BunkHouse which is an android application. With this proposal we aim to automate almost all the activities happening in a hostel. Data Security and data integration which was a major disadvantage of the existing system is the major concern here. Proposed framework provides smooth operation in retrieving data or details in a more systematic and pleasant way which saves a lot of human potential and time. Being an application, will run on any mobile phone without the need of

connecting to any external database as firebase already eliminates that problem. Firebase also reduces data redundancy and helps to store information of students and admins ensuring data integrity.

The proposed framework aims to interconnect all the hostellers, admin and processes involved in the hostel management.

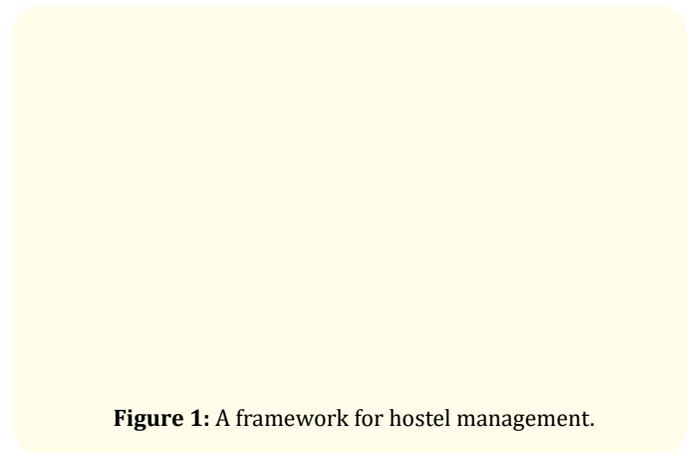


Figure 1: A framework for hostel management.

The home screen is the root node for the application; there are two different right and left node such as Admin login and student login. In student login the following menu is implemented student details, add student, write notice. The leaf node which contain edit student details, delete notice, read message, write message and view notice. The figure 1 shows complete frame work implementation for hostel management [8].

The figure 2 shows UML (Unified Modelling Language) designed for application. There are three types of actor such as primary actor, supporting actor, and offstage actor. The oval shape is usecase for the scenario, the line is used for communication purpose from the actor or actor to usecase [9].

Modules

Admin module

- **Login to Admin module:** Solely licensed or authorized user is allowed to access the data in the application. Once he/she verifies themselves by providing phone number generated OTP authentication, they can login.
- **Profile:** User can view and modify their profile which shows their important details.



Figure 2: Use case diagram.

- **Search a student:** User can search for a hosteller and view and modify their details.
- **View Complaints:** User can review or reject complaints send by the hostellers.
- **Write Notice:** User can write and edit notice to be sent to the hostellers.

Hosteller module

- **Login to Student Profile:** Solely licensed or authorized user is allowed to access the data in the application. Once he/she verifies themselves by providing phone number generated OTP authentication, they can login.
- **View Profile:** User can only view their profile and are not allowed to make any changes.
- **Write Complaint:** User can write complaint to the respective authority about his/her complain regarding any unpleasant situation, any other requirement or matters.
- **Change Password:** User can change their password anytime which will be stored and authenticated by firebase.

- **See Timetable:** User can see the respective timetable for the day.

The user has a lot of other options like changing their registered phone number, change their password, communicate with other users and send attachments etc.

Installation of bunkhouse

The proposed system being an application software can run on any device having android operating system. User will be able to download it from Google Play Store. After its installation the first activity or view that will loaded on the user's screen will be its home_activity.

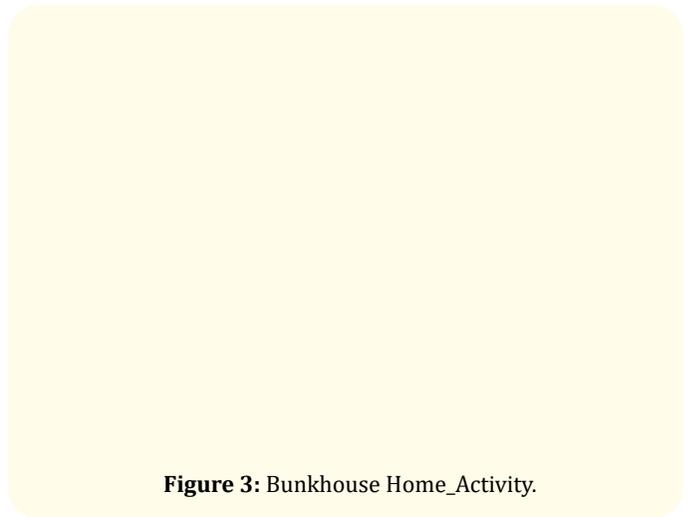


Figure 3: Bunkhouse Home_Activity.

Loggin in as a user

After logging in as a student or an admin, the user will be asked to verify a phone number authentication event on approval of which the user will be taken to their profile. The authentication will be approved by Firebase. The user will enter their registered phone number, if found a match for any profile in the firebase database, an OTP will be send on the user's registered phone number.

Loggin in as a student (hosteller)

After verification user will be taken their Home_Activity, admin will be taken to Admin_Home_Activity, and the student will be taken to Student_Home_Activity where they have a bunch of

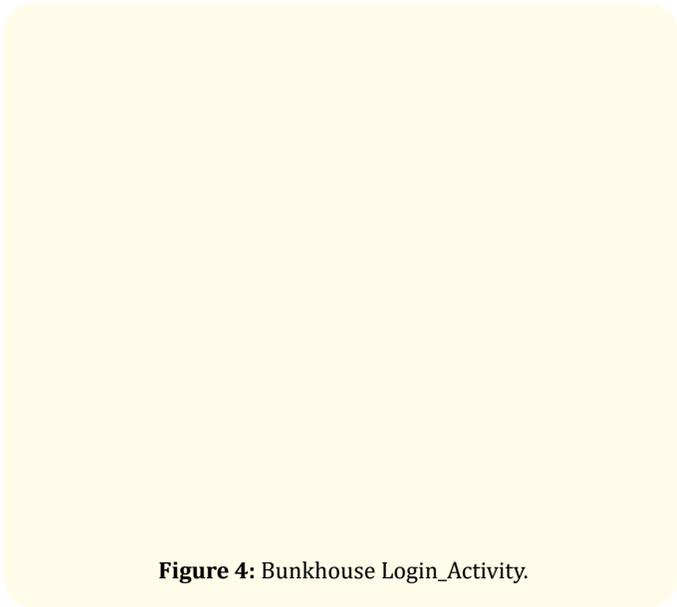


Figure 4: Bunkhouse Login_Activity.

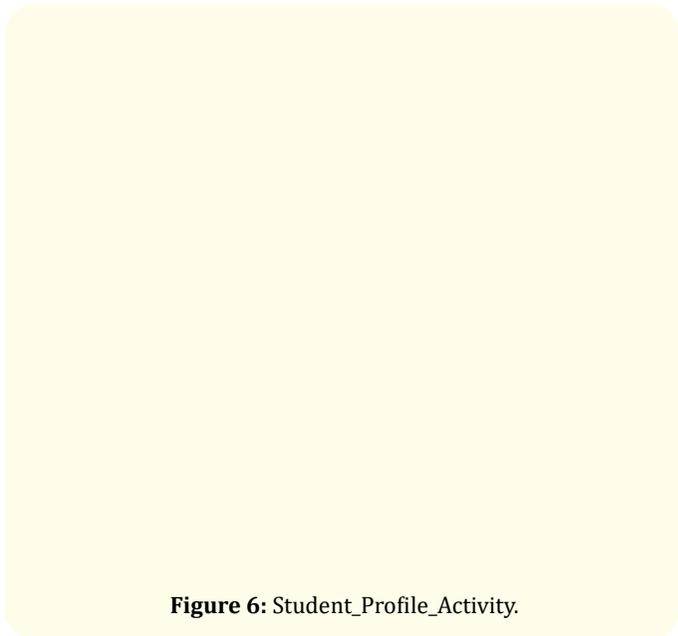


Figure 6: Student_Profile_Activity.

features. The Students can check their timetable, mess menu, check the noticeboard, file a complaint, manage contacts, check inbox etc.

Student complain and inbox

The user (student/hosteller) can file a complaint regarding any issue like electrical, plumbing, hostel fees etc. and can also manage their inbox. They can view their received messages, create a new message, view sent messages etc.

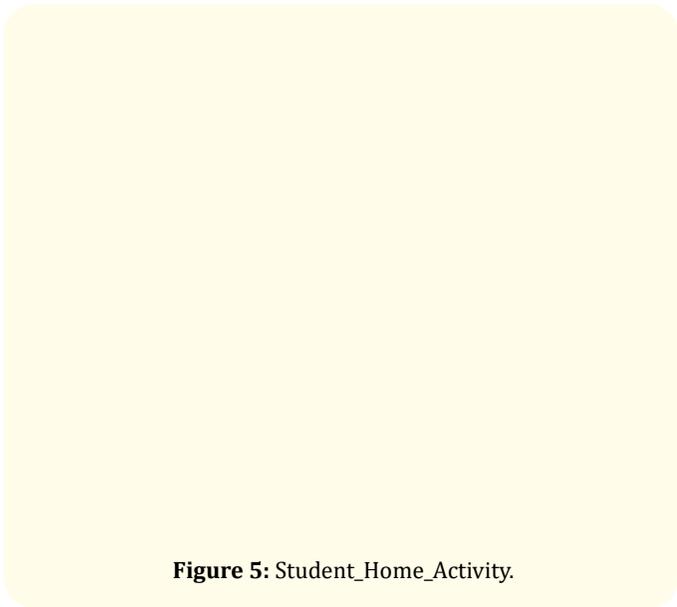


Figure 5: Student_Home_Activity.

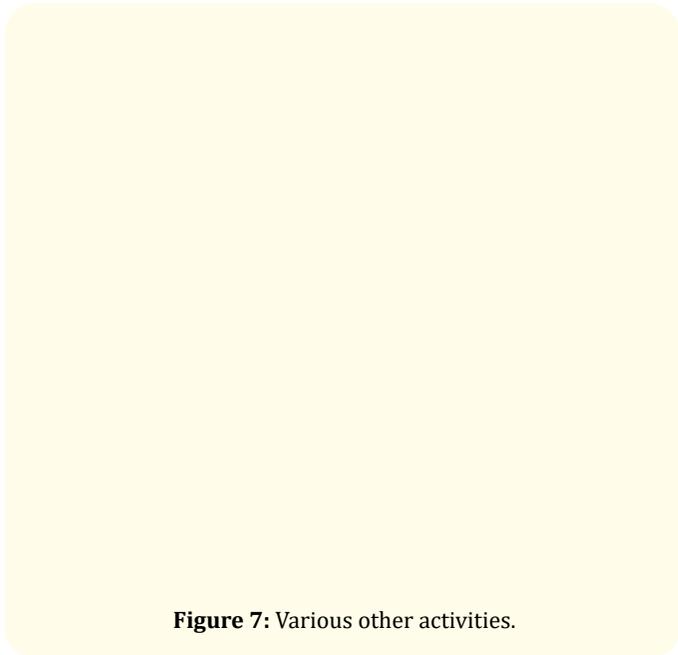


Figure 7: Various other activities.

Student profile

The user can view their profile and also change their password and update their mobile phone number. Since firebase is a real-time working database the user new phone number will be updated in the database on a real-time basis.

Requirements	Description
Hardware	Processor - i3 Hard Disk - 5 GB Ram - 2 GB
Software	Google chrome, Mozilla Firefox, I.E, etc.
Platform	Windows 7 or above
Programming Languages/ Tools	Java/ ml/Android Studio

Table 1: Requirements.

The above table 1 provides about details about hardware and software requirements [10].

Conclusion

In short about the proposed framework, the project created utilizing XML, Java EE, and SQL has been built with the prerequisite required details already implemented in the current available products including the details we gathered after the research of the current framework. It has been developed with adaptability for future improvements. The present programming requires a proper approach with a clean architecture to provide a better user experience. This Hostel management Android Application - BunkHouse is intended for individuals who need to handle different activities in the hostel. As seen in the last few years, the number of college and universities are increasing and so is the with the number of students, hence they do require an automated facilitated system that can reduce human effort and make administration easy but in a technological way.

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